Head very wide, vertex impunctate, encarpæ divided by a deep groove; face deeply excavated immediately below the antennæ, the anterior part of which is bounded at either side by a rounded lobe, while the latter are covered at their outer edge with long bristle-like hairs; penultimate joint of the maxillary palpi greatly swollen and dilated, the apical joint being almost buried in it; antennæ as long as the body, the first joint very slender and curved, the second very short, third joint as long as the first, dilated at the apex and deeply excavated, fourth and fifth joints nearly equal in length and as long as the first, covered, as well as the rest of the joints, with fringes of short hairs. Thorax transverse, sides greatly diverging from the base to the middle, from there to the apex produced and rounded; surface foveolate, either side near the base impunctate. Scutellum flavous, broad. Elytra convex, transversely depressed below the base, scarcely visibly punctured, from base to middle black, thence to the apex fulvous. Tibiæ and tarsi black.

Only a single specimen, a male, is known to me.

4. Note on a Specimen of *Charybdea haplonema*.

By Prof. J. Reay Greene, B.A., M.D., F.L.S., F.Z.S., &c.

[Received November 29, 1879.]

Dr. Pye-Smith, now Assistant Physician to Guy's Hospital, found, some years since, in the Museum of that institution, a nameless Medusa of strange appearance, from an unknown locality. Noting its exceptional form, he made a drawing of it, and at the same time observed such of its structural peculiarities as could be studied with due regard to the conservation of the single sample at his disposal. He also took the trouble of bringing the specimen to the meeting of the British Association at Belfast; but no one there could tell him to what group of jelly-fishes it should be referred. Hearing of this failure, I applied during the spring of the present year to Dr. Pye-Smith, who most kindly gave me every opportunity of examining this remarkable Medusa at my leisure.

I soon found that I had not to deal with an undiscovered species, but with none other than the *Tamoya haplonema* of Fritz Müller. It belongs to Gegenbaur's *Charybdeidæ*, a group not represented among the Medusæ of the British coasts.

Tamoya haplonema was described and figured twenty years ago by its discoverer, who found it on the shores of Santa Catharina (Brazil) —"am Strande der Praia de fora bei Desterro." It was not uncommon, more than a dozen specimens being sometimes procurable during one day. Occasionally it was accompanied by the much rarer *T. quadrumana*. No other naturalist appears to have met with these acalephs.

Our Medusa, however, is very closely allied to *Charybdea marsupialis*, the common marsupial Medusa of the Mediterranean. This species, the first discovered and best-known member of its group, is

the only charybdeid which has been reinvestigated by several observers. In particular Claus has just given us a monograph describing and illustrating, with great minuteness of detail, the form and structure of this common Mediterranean Medusa. His essay may justly rank as the most thorough analysis, hitherto published, of the anatomy of any Medusa whatsoever.

The affinity here noted was perceived by Fritz Müller, who at once referred his Medusæ to Gegenbaur's *Charybdeidæ*, in the definition of which family he proposed some modifications, to adapt it for the reception of the two species of the new genus *Tamoya*. The characters of the latter he contrasted with those of *Charybdea* (=*C. marsupialis* only) in parallel columns. But writing in 1859, at a distance from Europe, Fritz Müller needed the data we now possess for such a comparison. Claus, with his better knowledge of the Mediterranean species, has shown that the differences on which his predecessor relied do not in fact exist. We cannot estimate as of generic value the characters which separate *C. marsupialis* from *T. haplonema*. These Medusæ are therefore now placed in one genus (*Charybdea* of Claus, not Péron and Lesueur). They are very like one another, though both are obviously distinct from the rarer Brazilian species, *T. quadrumana*, for which the genus founded by Fritz Müller may still be retained.

The Brazilian is indeed much larger than the Mediterranean *Charybdea*, and in this respect resembles one of the unnamed *Charybdeidæ* (from the Philippine seas) provisionally described and figured in outline by Semper, who doubts the specific identity of any of his own forms with either of those discovered by Fritz Müller.

The *Charybdeidæ* are, unquestionably, of the greatest interest to any person wishing to understand the classificatiou of the Hydrozoa. They occupy an intermediate position between the lower and the higher Medusæ, although, arbitrarily, they may be placed with the latter. Their (1) external morphology, (2) curiously modified cœlenteric system, (3) genitalia quite distinct from the central region of the bell, with its four accessory cavities for the gastric tentacles, (4) muscular apparatus, and (5), above all, their very distinct nervous ring and wonderfully complicated sensory organs display a number of characters, the study of which must amply reward every earnest student of the lower animals. The whole of this subject, to which, sixteen years ago, I endeavoured to direct attention, is now, at length, admirably presented in the work of Claus.

No English zoologist has written on the *Charybdeidæ*; nor, so far as I am aware, has any paper on the Medusæ been read before our Society since Edward Forbes, in 1851, made a communication on *Æquorea*. But the study of the *Charybdeidæ* is so important that I have thought it desirable to append to the present note a brief history of the literature of these animals.

Plancus (1739) was the first to describe and figure one of the *Charybdeidæ*. His "urtica soluta marsupium referens" is the

common Mediterranean species. The rude, scarcely recognizable, figure is spoken of as "a very miserable representation" by Edward Forbes [1].

Risso [2], in 1826, gave a very imperfect account of the species of Plancus, under the name proposed for it by Péron.

Milne-Edwards (1833) took the lead among modern naturalists in adequately redescribing this singular acaleph, whose marginal bodies were more fully analyzed by Gegenbaur in 1856. Gegenbaur again directed attention to *C. marsupialis* in his systematic essay on the Medusæ, based chiefly on Mediterranean studies. Gräffe (1858) also described it, noticing more especially its marginal bodies and bunches of gastric tentacles. Costa (1836) must be added to the list of original observers of the same species. Kölliker (1866), using the results of his own studies, briefly compared the minute structure of its gelatinous disk with that of other Medusæ. Finally (1878) appeared the crowning work of Claus.

Of the other *Charybdeidæ* much less is known. Each species named in the annexed list appears to have been seen by one observer only. None is described in a manner at all satisfactory, if we except the two species of Fritz Müller.

Charybdea, *Pér. & Le S.*[3]	
periphylla, *Pér. & Le S.*[3]	Equatorial Atlantic.
bicolor, *Quoy & Gaim.*[4]	Cape-Verd Islands.
bitentaculata, *Quoy & Gaim.*[5] ...	Amboina.
campanella, *Less.*[6]	African Seas.
alata, *Reynaud*[7]	Atlantic Ocean.
Tamoya, *F. Müll.*[8]	
haplonema, *F. Müll.*[8]	Santa Catharina.
quadrumana, *F. Müll.*[8].....	Santa Catharina.
Marsupialis, *Less.*[9]	
flagellata, *Less.*[10]	New Guinea.
Bursarius, *Less.*[11]	
cythereæ, *Less.*[12].....	New Guinea.

Thus *Charybdeidæ* have been found along the western shores of the equatorial Pacific and the adjacent parts of the Indian Ocean, in

[1] 'British Naked-eyed Medusæ,' p. 91. The supposed copy (*vide* Eschscholtz) of this figure by Bruguière represented, according to Forbes, another species of Medusa.

[2] *Op. cit.* (*infrà*, p. 802). Little more than a record of the occurrence of this species near Nice.

[3] *Op. cit.* p. 332; Milne-Edwards (Cuvier), pl. 55. fig. 2.

[4] *Op. cit.* p. 293, and pl. 25. figs. 1–3.

[5] *Op. cit.* p. 295, and pl. 25. figs. 4, 5.

[6] Prodr. 23; Acalèphes, p. 267, and pl. 6. fig. 6.

[7] Lesson, Cent. zool. p. 95, and pl. 33; *Marsupialis alata*, Prodr. 26; Acalèphes, p. 278.

[8] *Op. cit.* (1859), p. 3, and Taf. i., ii.

[9] Prodr. 10; Acalèphes, p. 268.

[10] Prodr. 27; Acalèphes, p. 278. Not figured.

[11] Voy. de la Coquille, Zoophytes, p. 108; Prodr. 11; Acalèphes, 278.

[12] Coquille, Zoophytes, p. 108, and pl. 14. fig. 1; Acalèphes, p. 279. "*Beroe gargantua*, Less. Zool. Coq. pl. 15. fig. 1, seems to be only a large decayed specimen of the same species" (Agassiz, Contr. vol. iv. p. 174).

the tropical and subtropical regions of the Atlantic, and in the Mediterranean; while in latitude they extend from Nice and the Adriatic (*C. marsupialis*) to Santa Cathariua.

According to Agassiz[1], "*Charybdea bitentaculata*, Q. and G., is a *Campanella*[2]; *Ch. bicolor*, Q. and G., constitutes a distinct genus, *Quoya*, Ag.; *Ch. campanella*, Less., may also constitute a distinct genus."—"It remains doubtful to what genus Lesson's *Marsupialis flagellata*, from New Guinea, ought to be referred. It constitutes, probably, a distinct genus, on account of its tentacles."

Semper has given us precursory notices of some half-dozen species of *Charybdeidæ* from the Philippine shores. The full details of his researches on these and other acalephs are looked forward to by many naturalists with great interest[3].

[1] 'Contributions, vol. iv. p. 174.

[2] To which genus Agassiz also refers *Charybdea capitulum*, Q. & G. MS., De Bl. anct. See his explanatory note in 'Contr.' vol. iv. p. 169.

[3] Semper found three species round the Pelew Islands. The first was more than 7″ high, scarcely 3″ across. Wall of disk extraordinarily thick, almost cartilaginous, quite colourless and transparent. The four tentacles were torn off just beyond their broad cartilaginous basal portions. A wide depending veil. Margin weakly lobed: just above it, in as many depressions capable of being closed, were the four marginal bodies. Manubrium dependent, not lobed. Central cavity of disk small. Lateral pouches very broad from their origin: between two contiguous pouches the umbrellar and subumbrellar walls were in contact, giving rise to the false appearance of a canal. Gastric tentacles in four double groups about the central cavity. But one (not-sexual) example (Taf. xxxix. f. 9).

The disk of the second species was only $1\frac{1}{4}$″ high, $\frac{7}{8}$″ across. Tentacles extensile to about twice the length of disk, with narrow basal lobes. Veil more complicated than in last species, always elevated, and held in this position by four subumbrellar septa, each springing from the mid line of a swelling, on the umbrellar aspect of which is the depressed cavity, opening outwards, whence the marginal body arises: septa perpendicular to subumbrella, and extending across the veil, which by them is hindered from assuming a horizontal position. Into each of the four broad lateral pouches freely project two sexual laminæ, of which one arises on either side of the partition between two adjacent pouches. Sexual products discharged through a single series of small openings, which run close beside the attached border of each genital plate and lead into the lateral pouches. Manubrium short, four-lobed. Central cavity wide, with four double groups of gastric tentacles (Taf. xxxix. f. 8).

A conspicuous nerve-ring exists in this and the preceding species. It pursues a zig-zag course (with eight octants), ascending slightly on either side of each marginal body, then descending and reaching its lowest point near the outer margin of the disk in the mid line of a tentacular lobe.

The third species, scarcely $\frac{1}{2}$″ high, differs in many points essentially from the two others. Tentacles four, ringed with brown and yellow, destitute of basal lobes. Of a beautiful yellow tint were likewise the sexual laminæ and four groups of gastric tentacles. No veil. Margin strongly eight-lobed, bearing a shorter rudimentary tentacle between every two principal tentacles. The four very broad lateral pouches interrupted in their inferior third by thickenings of the substance of the disk, constituting the floors of the small cavities for the four marginal bodies. Each of the eight sexual laminæ much indented about the middle of its free margin. Only two examples were secured; so that some structural features could not be clearly determined (Reisebericht, 1863).

A fourth species, fished up in May during a voyage from Manila to Komblon, was very like one of the forms just noticed. From July to September Semper

We may now trace the attempts of successive zoologists to interpret *Charybdeidæ*. Linnæus records the species of Plancus in the Systema Naturæ (ed. xii. p. 1097)[1] as *Medusa marsupialis*. He is followed by Gmelin[2] and Modeer[3].

In 1809 Péron and Lesueur found the genus *Carybdea*. It includes their new species (*C. periphylla*) together with that of Plancus. Lamarck[4], Cuvier[5], Goldfuss[6], Schweigger[7], the editors of the Encyclopédie Méthodique[8] and Latreille[9], accept the new genus.

Eschscholtz does not cite Péron's new species or genus. He refers the species of Plancus to *Oceania* as *O. marsupialis*[10].

Milne-Edwards suggests the affinity of *C. marsupialis* to *C. alata*, Reynaud, and *Bursarius cythereæ*, Lesson.

De Blainville[11] retains the genus of Péron, and gives in his Atlas the first copy of Lesueur's previously unpublished figure of *C. periphylla*. Coloured figures of this species (likewise copied from Lesueur's drawing) and of *C. marsupialis* (original) are added by Milne-Edwards to the large illustrated edition of 'Le Règne Animal.'

Lesson[12] is the first to break up the genus of Péron. His *Carybdea* includes *C. periphylla*, while the species of Plancus is referred (as *M. planci*) to the new genus *Marsupialis*. This procedure is subsequently sanctioned by Agassiz. Lesson proposes the two tribes of

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found at Komblon a fifth species with very peculiar genitalia. Each of these does not, as in other Charybdeidæ, form a continuous lamina freely projecting into its lateral pouch. The genitalia are constituted rather by the modified walls of diverticula from the pouches. They form, when mature, branched arbuscules, reaching far into the interior of the disk itself and splinted by processes of its gelatinous substance. In the lumen between these processes and their investing inner membrane [endoderm] the sexual products are developed.

Semper further notes a small acaleph, likewise velate and probably charybdeoid, with very complex marginal bodies. In this connexion he declares it unnatural to insist on establishing two primary groups of discoid Medusæ after the manner of Eschscholtz and his successors. Such divisions, based on single characters, arise from the delusive desire to thrust a straight-jacket of man's device upon the free creations of nature (Reisebericht, 1864).

[1] Tom. i. pars ii. (1767). Also ed. x. tom. i. p. 660 (1760).

[2] Syst. Nat. p. 3154.

[3] Whose work I have not seen. I take this reference from Eschscholtz.

[4] Hist. nat. des animaux sans vertèbres, tome ii. p. 496 (1816).

[5] Le Règne animal, tome iv. p. 59. "Lorsque ces animaux si simples prennent plus de concavité, leur surface inférieure devient intérieure, et peut être regardée comme un véritable estomac. Ce sont les Carybdées, Pér. Ceux où l'on ne voit à l'intérieur aucunes traces de vaisseaux, ne diffèrent proprement des *hydres* que par la grandeur." 1817.

[6] Handbuch der Zoologie, erste Abtheilung, p. 111 (1820).

[7] Handbuch der Naturgeschichte der skelettlosen ungegliederten Thiere, p. 500 (1820).

[8] Histoire naturelle des Zoophytes ou Animaux Rayonnés, faisant suite à l'Histoire naturelle des Vers de Bruguière; par MM. Lamouroux, Bory de Saint-Vincent et Eud. Deslongchamps, tome ii. p. 165 (1824).

[9] Familles naturelles du règne animal, p. 540 (1825).

[10] System der Acalephen, p. 101 (1829). De Blainville carelessly states that Eschscholtz places this species in *Æquorea*.

[11] Manuel d'Actinologie, p. 275, and Atlas, pl. xxxi. f. 1 (1834).

[12] Prodrome (1837); Histoire naturelle des Zoophytes—Acalèphes (1843).

Carybdeæ (*Carybdea, Obelia*) and Marsupialeæ (*Marsupialis, Bursarius, Mitra, Eurybia, Cytæis, Campanella, Scyphis*). He has "associated with both of them several species which have not the remotest affinity with the type."

Lütken[1], in a critical revision of the lower Medusæ, places *Carybdea* at the head of his family *Ægineæ*. Burmeister[2] follows him.

Gegenbaur[3] differs both from Lesson and Lütken. He establishes the family *Charybdeidæ*, placing it with the higher Medusæ (his *Acraspeda*).

Fritz Müller[4] discusses the structure and classificatory value of the peculiar gastric tentacles of the higher Medusæ. In a later essay[5] he proposes the following arrangement.

Æginoida (Ægineæ, *Lutk.*).
a. Lower. Cunina (Æginа rosea, *Eschsch.*); Ægineta; Polyxenia; Æginopsis bitentaculata.
b. Higher: *Charybdeidæ.* Æginopsis laurentii (?); Ægina (citrea); Charybdea (marsupialis); Tamoya; Periphylla (Ch. periphylla, *Pér.*).

The *Æginoida* here constitute an order of *Hydromedusæ*, equivalent to the orders *Siphonophora*, *Hydroida*, and *Acalephæ* (R. Leuckart, =*Phanerocarpæ*, Eschsch.). Fritz Müller has conscientiously endeavoured to group the results of his own investigations with every regard to the labours of his predecessors.

Agassiz (1862) more fully expresses somewhat similar opinions in the annexed tabular view (here condensed)[6].

Order DISCOPHORÆ.
Suborder 1. Rhizostomeæ.
Suborder 2. Semæostomeæ.
Suborder 3. Haplostomeæ.
1st Family. Thalassanthеæ, *Lesson* (=Æginidæ).
2nd Family. Brandtidæ, *Agass.*
Dodecabostrycha, *Brandt.*
Quoyia, *Agass.* (=Carybdea bicolor, *Q. & G.*).
3rd Family. Charybdeidæ, *Less.*
Charybdea, *Less.*, after *P. & L.* (=C. periphylla only).
4th Family. Marsupialidæ, *Less.*
Marsupialis, *Less.* (=M. planci).
Tamoya, *Fritz Müller.*
T. haplonema.
T. alata (=Carybdea alata, *Reynaud*).
Bursarius, *Less*, 1836 (A misprint for 1830).
Chiropsalmus, *Agass.* (=Tamoya quadrumana).
5th Family. Lucernariadæ, *Johnst.*

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[1] Nogle Bemærkninger om Medusernes systematiske Inddeling, navnlig med Hensyn sil Forbes's History of Brittish naked-eyed Medusæ. Kjöbenhavn Vidensk. Medd. 1850, pp. 15–35. See p. 27.

[2] Zoonomische Briefe, erster Theil, p. 168 (1856).

[3] *Op. cit.* ('Versuch'). [4] *Op. cit.* (1859).

[5] *Op. cit.* (1862).

[6] From vol. iv. of his 'Contributions to the Natural History of the United States of North America.' The 'Second Monograph' (vols. iii. & iv.) is devoted to the Acalephs. Seeing the value and beauty of this admirably illustrated work, *facile princeps* among treatises on the Hydrozoa, one regrets that no living Charybdeidæ were studied by the author in person.

One cannot but regard the family of Brandtidæ as doubtful. Was not Brandt right in constituting his *Dodecabostrycha*[1] a subgenus of *Chrysaora*? It differs from the latter, and resembles the *Charybdeidæ*, chiefly in so far as it is quadripartite. The genus *Quoyia*[2] is very obscure. As to the two other families of Agassiz, it seems inconvenient to revive Lesson's nomenclature. Fritz Müller is certainly right in retaining the generic name *Charybdea* for the first-discovered species of the group. In this he has the support of his predecessors (including Péron himself) as well as of most later writers, such as Gegenbaur, Gräffe, Kölliker and Claus. It may be true that Péron regarded his own species[3], and not that of Plancus, as the type of his genus. In so doubtful a case the free action of the law of priority in nomenclature is certainly impeded. Agassiz and Haeckel are the only two zoologists who have given their sanction to Lesson's innovations. They have by so doing tended to promote confusion, and unnecessarily opposed themselves to a large working majority of their brethren. As to the genus *Chiropsalmus*, since Claus has shown *T. haplonema* to be a true *Charybdea*, it becomes a synonym of *Tamoya* proper.

Gegenbaur's family is adopted by myself[4], by Victor Carus[5], and at a later period by Schmarda[6].

Fritz Müller, in a letter to Alexander Agassiz[7], considers it highly probable that *Trachynema* may be the young of *Tamoya*. Subsequent researches of Mecznikow[8] show this view not to be tenable.

Haeckel, in 1866[9], adopted Lesson's two families, *Charybdeidæ* and *Marsupialidæ*, as revised by Agassiz. He associated them in one order, *Elasmorchida*, under his subclass of *Trachymedusæ*[10].

Haeckel is about to issue a great work on the Medusæ in the (postponed) first volume of the new 'Jenaische Denkschriften.' Meanwhile he has published his "System of the Medusæ"[11]. Of this group he recognizes two primary divisions, the second of which includes Gegenbaur's *Acraspeda* together with the *Lucernariæ*. These last make one order (*Scyphomedusæ*), while the *Phanerocarpæ* of Eschscholtz constitute another (*Discomedusæ*). Between *Scypho-* and

[1] See Brandt, in 'Mémoires de l'Acad. Imp. des Sc. de St.-Pétersbourg,' besonders abgedruckt, p. 384, and Taf. xxix., xxx. (1838).

[2] Compare the remarks of Agassiz (Contr. iv. p. 173), and consult the original figure.

[3] This singular and but little understood form undoubtedly constitutes a distinct genus, for which Fritz Müller's name is the best. The species might henceforth be cited as *Periphylla péronii* (or *P. charybdeoides*).

[4] Natural-History Review, July, 1863, p. 350 and context.

[5] Handbuch der Zoologie, ii. p. 548 (1863).

[6] Zoologie, i. p. 232 (1871).

[7] Illustrated Catalogue of the North-American Acalephæ, p. 55 (1865).

[8] Whose Russian memoir I have not seen. I refer, therefore, to Leuckart's 'Bericht' for 1870-71, p. 163 (1874).

[9] Generelle Morphologie der Organismen, Bd. ii. p. lix.

[10] Equivalent to Haplostomeæ with Trachynemidæ of Alex. Agassiz.

[11] Sitzungsberichte der Jenaischen Gesellschaft für Medicin und Naturwissenschaft, für das Jahr 1878. Published in 1879. Haeckel's "System" was communicated on 26th July (pp. lxxviii–lxxx).

Discomedusæ Haeckel places the *Charybdeidæ*, arranged under two orders and five families, as follows:—

CONOMEDUSÆ.
Charybdeidæ.
Bursaridæ.
Chiropsalmidæ.
PEROMEDUSÆ.
Periphyllidæ.
Pericryptidæ.

Haeckel, therefore, as touching the genera *Charybdea* and *Periphylla*, would seem to have reverted to the nomenclature of Fritz Müller. His work is impatiently expected, since his opportunities of studying the Medusæ have been varied and extensive. The deep-sea forms obtained during the voyage of the 'Challenger' have also been intrusted to him. We do not know what new *Charybdeidæ* he has investigated, or whether he is justified in his apparently extreme subdivision of this group. So copious and diversified an assemblage as the *Phanerocarpæ* will probably by most zoologists continue to be regarded as of higher rank than either of the two moieties of Gegenbaur's single family, notwithstanding that the *Charybdeidæ* of the latter are structurally more modified and more numerous than Gegenbaur, writing in 1856, could have supposed.

Before instituting his own researches on *Charybdea*, Claus[1] reviewed with care what had been done by others. While pointing out a number of discrepancies, he shows the true significance of the structure of these Medusæ, and demonstrates their affinities with great clearness. His results, critical and original, are well epitomized in his 'Zoologie'[2]. He neglects many ill-defined species, and thus arranges the few which have hitherto been properly described and figured.

Suborder LOBOPHORA *s.* MARSUPIALIDA.
Family CHARYBDEIDÆ.
Genus *Charybdea*, Pér.
Ch. marsupialis, Pér. & Le S.
Ch. haplonema, Fr. Müll.
Genus *Tamoya*, Fr. Müll.
T. quadrumana, Fr. Müll.

Literature of the Charybdeidæ.

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[1] Studien über Polypen und Quallen der Adria. I. Acalephen (Discomedusen), 1877. Reprinted from 'Wiener Denkschriften,' Band xxxviii. See pp. 53–60.

[2] Grundzüge der Zoologie, 4te Auflage, Band i. erste Lieferung, pp. 287–289 (1879, but issued in 1878).

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Lesson, R. P.—Prodrome d'une monographie des Méduses. In-4to de 62 pages; Rochefort, juin 1837. I have not seen this 'Prodrome,' which has now but an historical interest, since its contents are dispersed throughout the author's 'Acalèphes.' See the latter (p. 50) and a note by Agassiz ('Contr.' vol. iii. p. 24.)

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[1] Busk was the first English naturalist to give a more accurate and critical account of the marginal bodies of the Medusæ. See his "Observations on certain points in the Anatomy of a species of *Thaumantias*," in Trans. Micr. Soc. London, vol. iii. p. 22 (1852).

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5. On a Four-horned Chamois.

By Edward R. Alston, F.L.S., F.Z.S., &c.

[Received December 10, 1879.]

Mr. Sclater has asked me to describe the monstrous horns of *Rupicapra tragus* (Gray) which he exhibited at the meeting of the 18th November on behalf of Mr. Rowland Ward[1].

This interesting specimen has been a good deal injured and carefully repaired; but fortunately the frontal sinuses and bases of the horn-cores are uninjured, so that there can be no doubt as to the genuineness of the deformity. The four horns are all perfectly well-formed and symmetrical, the normal pair measuring about 8·75 inches along their anterior curve, and indicating that the animal was an adult male, at least five years old. The abnormal horns grow from close to the bases of the usual pair, on the outside and a little to the rear; they are equally well formed, but are less curved and much shorter, measuring 5 and 5·25 inches respectively. The cores of the normal and abnormal horns are continuous at their bases, separating a little above the level of the frontal bone; and the air-sinuses extend into both of them; so that the deformity really consists in a bifurcation of the core, each duplication being covered by a distinct horn-sheath.

I have not been able to find any record of a similar abnormity in the Chamois in the works of Swiss or German zoologists; nor have I ever seen any exactly similar monstrosity in any other animal. In the "Many-horned Sheep" of the Hebrides the attachment of the supplementary horns is usually very irregular, and does not seem to be due to duplication of the cores. Colonel Godwin-Austen, however, informs me that in Kishtwar (a district south-east of Kashmir) the natives carefully preserve a breed of four-horned sheep, in which

[1] *Cf. suprà*, p. 666.